Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously Presented) A modified substrate comprising:

(a) a substrate having a surface, the surface having at least one biomolecule covalently linked thereto; and

(b) at least one nanocylinder having at least one complementary biomolecule covalently linked thereto;

wherein the at least one nanocylinder is attached to the surface through biomolecular interactions between the at least one biomolecule covalently linked to the surface and the at least one complementary biomolecule covalently linked to the at least one nanocylinder.

2. (Original) The modified substrate of Claim 1 wherein the at least one nanocylinder is a nanotube or nanorod.

3. (Original) The modified substrate of Claim 1 wherein the at least one nanocylinder is a carbon nanotube.

4. (Original) The modified substrate of Claim 1 wherein the at least one nanocylinder is a gold or silver nanorod.

5. (Previously Presented) The modified substrate of Claim 1 wherein the at least one biomolecule covalently linked to the surface and the at least one complementary biomolecule covalently linked to the at least one nanocylinder are independently selected from the group consisting of oligonucleotide sequences, amino acid sequences, proteins, protein fragments, ligands, receptors, receptor fragments, antibodies, antibody fragments, antigens, antigen fragments, enzymes, and enzyme fragments.

6. (Previously Presented) The modified substrate of Claim 1 wherein the at least one biomolecule covalently linked to the surface comprises an oligonucleotide sequence and the at least one complementary biomolecule covalently linked to the at least one nanocylinder comprises a complementary oligonucleotide sequence.

7. (Previously Presented) The modified substrate of Claim 1 wherein the at least one biomolecule covalently linked to the surface and the at least one complementary biomolecule covalently linked to the at least one nanocylinder form a protein-ligand pair.

8. (Previously Presented) The modified substrate of Claim 7 wherein the at least one biomolecule covalently linked to the surface comprises avidin or Streptavidin and the at least one complementary biomolecule covalently linked to the at least one nanocylinder comprises biotin.

9. (Original) The modified substrate of Claim 1 wherein the substrate is selected from the group consisting of silicon, glass, glassy carbon, gold, and diamond thin film substrates.

10. (Previously Presented) The modified substrate of Claim 1 wherein the covalent linkage between the at least one nanocylinder and the at least one complementary biomolecule comprises the reaction product of an amine terminated nanocylinder with a molecule comprising a maleimide group.

11. (Previously Presented) The modified substrate of Claim 10 wherein the covalent linkage between the at least one nanocylinder and the at least one complementary biomolecule further comprises the reaction product of the molecule comprising the maleimide group and a thiol terminated biomolecule.

12. (Withdrawn) A method comprising exposing a substrate having a surface, the surface having at least one biomolecule bound thereto, to at least one nanocylinder having at least one complementary biomolecule covalently linked thereto, wherein biomolecular interactions between the at least one biomolecule bound to the surface and the at least one complementary

biomolecule covalently linked to the at least one nanocylinder attach the at least one nanocylinder to the surface.

13. (Withdrawn) The method of Claim 12, further comprising annealing the surface having the at least one nanocylinder attached thereto at a temperature sufficient to strengthen the attachment between the surface and the at least one nanocylinder.

14. (Withdrawn) The method of Claim 12 wherein the method is carried out at room temperature.

15. (Withdrawn) The method of Claim 12 wherein the at least one nanocylinder is a nanotube or nanorod.

16. (Withdrawn) The method of Claim 12 wherein the at least one nanocylinder is a carbon nanotube.

17. (Withdrawn) The method of Claim 12 wherein the at least one nanocylinder is a gold or silver nanorod.

18. (Withdrawn) The method of Claim 12 wherein the at least one biomolecule bound to the surface and the at least one complementary biomolecule covalently linked to the at least one nanocylinder are independently selected from the group consisting of oligonucleotide sequences, amino acid sequences, proteins, protein fragments, ligands, receptors, receptor fragments, antibodies, antibody fragments, antigens, antigen fragments, enzymes, and enzyme fragments.

19. (Withdrawn) The method of Claim 12 wherein the at least one biomolecule bound to the surface comprises an oligonucleotide sequence and the at least one complementary biomolecule covalently linked to the at least one nanocylinder comprises a complementary oligonucleotide sequence.

20. (Withdrawn) The method of Claim 12 wherein the at least one biomolecule bound to the surface and the at least one complementary biomolecule covalently linked to the at least one nanocylinder form a protein-ligand pair.

21. (Withdrawn) The method of Claim 20 wherein the at least one biomolecule bound to the surface comprises avidin or Streptavidin and the at least one complementary biomolecule covalently linked to the at least one nanocylinder comprises biotin.

22. (Withdrawn) The method of Claim 12 wherein the substrate is selected from the group consisting of silicon, glass, glassy carbon, gold, and diamond thin film substrates.

23. (Withdrawn) The method of Claim 12 wherein the covalent linkage comprises the reaction product of an amine terminated nanocylinder with a molecule comprising a maleimide group.

24. (Withdrawn) The method of Claim 23 wherein the covalent linkage further comprises the reaction product of the molecule comprising the maleimide group and a thiol terminated biomolecule.

25-31. (Canceled)

32. (Previously Presented) A nanocylinder bridge comprising:

(a) a first surface having at least one biomolecule covalently linked thereto;

(b) a second surface having at least one biomolecule covalently linked thereto; and

(c) a nanocylinder having at least two biomolecules covalently linked thereto,

wherein one of the at least two biomolecules on the nanocylinder is bound to the at least one biomolecule on the first surface through biomolecular interactions between said biomolecule on the nanocylinder and said biomolecule on the first surface and the other of the at least two biomolecules on the nanocylinder is bound to the at least one biomolecule on the second surface through biomolecular interactions between said biomolecule on the nanocylinder and said biomolecule on the second surface to form a bridge between the first and the second surfaces.

33. (Original) The nanocylinder bridge of Claim 32 wherein the nanocylinder is a carbon nanotube.

34. (Previously Presented) The nanocylinder bridge of Claim 33 wherein each of the at least two biomolecules covalently linked to the carbon nanotube is linked to or near a different end of the carbon nanotube.

35. (Previously Presented) The nanocylinder bridge of Claim 32 wherein one of the at least two biomolecules covalently linked to the nanocylinder specifically binds to the biomolecule covalently linked to the first surface, but not to the biomolecule covalently linked to the second surface, and the other of the at least two biomolecules covalently linked to the nanocylinder specifically binds to the biomolecule covalently linked to the second surface, but not to the biomolecule covalently linked to the first surface.

36. (Original) The nanocylinder bridge of Claim 32 wherein the first and second surfaces are metal surfaces.

37. (Previously Presented) A patterned surface comprising a surface having a plurality of nanocylinders arranged thereon in a predetermined pattern, wherein the nanocylinders are attached to the surface by biomolecular interactions between biomolecules covalently linked to the surface and their complementary biomolecules covalently linked to the nanocylinder, and further wherein the pattern is predetermined by the locations of the biomolecules on the surface and their complementary biomolecules on the nanocylinders.